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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,950	06/29/2006	Ho-Yong Jeong	P1976US00	2844

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EXAMINER	
MCDOWELL, JR, MAURICE L	
ART UNIT	PAPER NUMBER
2628	

NOTIFICATION DATE	DELIVERY MODE
09/30/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/596,950	JEONG ET AL.	
	Examiner	Art Unit	
	MAURICE MCDOWELL, JR	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/31/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins Pub. No.: US 2005/0083344 A1 in view of Dyke et al. Pub. No.: US 2005/0062756 A1.

3. Regarding claim 1, Higgins teaches: An apparatus of converting three color image signals into four color image signals having a white signal, the apparatus comprising: a storing unit storing a plurality of white scaling factors (fig. 1, 108); and converting the three color image signals into the four color image signals based on the selected white scaling factor and outputting the converted four color image signals (fig. 8, 824) [0048].

4. Higgins doesn't teach: a signal converting unit selecting a corresponding white scaling factor of the white scaling factors stored in the storing unit based on a white scaling signal from an external.

5. The analogous prior art Dyke teaches: a signal converting unit selecting a corresponding white scaling factor of the white scaling factors stored in the storing unit based on a white scaling signal from an external (fig. 3, 124) for the benefit of providing a color space conversion

system and method that may linearly adjust the input to and the output from the conversion matrix independent of the color look up table efficiently.

6. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine a signal converting unit selecting a corresponding white scaling factor of the white scaling factors stored in the storing unit based on a white scaling signal from an external as shown in Dyke with Higgins for the benefit of providing a color space conversion system and method that may linearly adjust the input to and the output from the conversion matrix independent of the color look up table efficiently.

7. Regarding claim 2, Higgins teaches: The apparatus, further comprising: a digamma processing unit digamma processing the three color image signals and applying to the signal converting unit (fig. 1, 108); and a gamma processing unit gamma processing the four color image signals from the signal converting unit (fig. 1, 110).

8. Regarding claim 3 Higgins, teaches: The apparatus, wherein the storing unit is a lookup table [0037].

9. Regarding claim 11, Higgins teaches: A display device comprising: a plurality of pixels arranged in a matrix (fig. 8, 824); an image converting unit converting three color image signals into four color image signals [0048]; wherein the image converting unit further comprises a storing unit storing the white scaling factors (fig. 1, 108), and converts the three color image signals into the four color image signals based on the selected white scaling factor (fig. 8, 824) [0048].

10. Higgins doesn't teach: a gray voltage generating unit generating a plurality of gray voltages; and a data driving unit selecting gray voltages corresponding to the converted four

color signals among the gray voltages from the gray voltage generating unit, wherein the image converting unit selects a corresponding white scaling factor of the white scaling factors based on a white scaling signal from an external.

11. The analogous prior art Dyke teaches: a gray voltage generating unit generating a plurality of gray voltages [0013] (The voltage in the circuit that converts the three color image signals); and a data driving unit selecting gray voltages corresponding to the converted four color signals among the gray voltages from the gray voltage generating unit [0013] (The voltage in the circuit does the selecting), wherein the image converting unit selects a corresponding white scaling factor of the white scaling factors based on a white scaling signal from an external (fig. 3, 124) for the benefit of providing a color space conversion system and method that may linearly adjust the input to and the output from the conversion matrix independent of the color look up table efficiently.

12. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine a gray voltage generating unit generating a plurality of gray voltages; and a data driving unit selecting gray voltages corresponding to the converted four color signals among the gray voltages from the gray voltage generating unit, wherein the image converting unit selects a corresponding white scaling factor of the white scaling factors based on a white scaling signal from an external as shown in Dyke with Higgins for the benefit of providing a color space conversion system and method that may linearly adjust the input to and the output from the conversion matrix independent of the color look up table efficiently.

13. Claims 4-10, 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins Pub. No.: US 2005/0083344 A1 in view of Dyke et al. Pub. No.: US 2005/0062756 A1 further in view of Lee et al. Pub. No.: US 2003/0151694 A1.

14. Regarding claim 4, Higgins teaches: The apparatus, wherein the signal converting unit converts the three color image signals into the four color image signals depending on the calculated increasing ratio and the three color image signals [0048].

15. The previous combination of Higgins and Dyke remains as above but doesn't teach: extracts a maximum value and a minimum value of the three color image signals, determines that the three image color signals are included in a fixed scaling area or a variable scaling area based on the maximum value and the minimum value, calculates a increasing ratio based on a fixed scaling factor when the three color image signals are included in the fixed scaling area, calculates the increasing ratio based on the maximum value, the minimum value, and the selected white scaling factor when the three color image signals are included in the variable scaling area.

16. The analogous prior art Lee teaches: extracts a maximum value and a minimum value of the three color image signals (fig. 6, 50), determines that the three image color signals are included in a fixed scaling area or a variable scaling area based on the maximum value and the minimum value (fig. 4, 10), calculates a increasing ratio based on a fixed scaling factor when the three color image signals are included in the fixed scaling area (fig. 4, 12), calculates the increasing ratio based on the maximum value, the minimum value, and the selected white scaling factor when the three color image signals are included in the variable scaling area (fig. 4, 12) for the benefit of providing a method for changing the brightness of an image, which can increase the brightness of the image while maintaining the hue and saturation of the image.

17. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine extracts a maximum value and a minimum value of the three color image signals, determines that the three image color signals are included in a fixed scaling area or a variable scaling area based on the maximum value and the minimum value, calculates a increasing ratio based on a fixed scaling factor when the three color image signals are included in the fixed scaling area, calculates the increasing ratio based on the maximum value, the minimum value, and the selected white scaling factor when the three color image signals are included in the variable scaling area as shown in Lee with the previous combination for the benefit of providing a method for changing the brightness of an image, which can increase the brightness of the image while maintaining the hue and saturation of the image.

18. Regarding claim 5, Higgins doesn't teach: The apparatus, wherein the fixed scaling factor is to add "1" to the selected white scaling factor.

19. The analogous prior art Dyke teaches: The apparatus, wherein the fixed scaling factor is to add "1" to the selected white scaling factor (fig. 4, 136) for the benefit of providing a color space conversion system and method that may linearly adjust the input to and the output from the conversion matrix independent of the color look up table efficiently.

20. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine wherein the fixed scaling factor is to add "1" to the selected white scaling factor as shown in Dyke with Higgins for the benefit of providing a color space conversion system and method that may linearly adjust the input to and the output from the conversion matrix independent of the color look up table efficiently.

21. Regarding claim 6, Higgins doesn't teach: The apparatus, wherein the white scaling factors have values between 0.8 and 0.9; and each of scaling factors has a value divided equally by eight between 0.8 and 0.9.

22. The analogous prior art Dyke teaches: The apparatus, wherein the white scaling factors have values between 0.8 and 0.9; and each of scaling factors has a value divided equally by eight between 0.8 and 0.9 (fig. 4, 136) for the benefit of providing a color space conversion system and method that may linearly adjust the input to and the output from the conversion matrix independent of the color look up table efficiently.

23. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine wherein the white scaling factors have values between 0.8 and 0.9; and each of scaling factors has a value divided equally by eight between 0.8 and 0.9 as shown in Dyke with Higgins for the benefit of providing a color space conversion system and method that may linearly adjust the input to and the output from the conversion matrix independent of the color look up table efficiently.

24. Regarding claim 7, Higgins doesn't teach: The apparatus, wherein the white scaling factors are eight whites scaling factors.

25. The analogous prior art Dyke teaches: The apparatus, wherein the white scaling factors are eight whites scaling factors (fig.4, 136) for the benefit of providing a color space conversion system and method that may linearly adjust the input to and the output from the conversion matrix independent of the color look up table efficiently.

26. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine wherein the white scaling factors are eight whites scaling factors as shown

in Dyke with Higgins for the benefit of providing a color space conversion system and method that may linearly adjust the input to and the output from the conversion matrix independent of the color look up table efficiently.

27. Regarding claim 8, Higgins teaches: A method of converting three color image signals into four color image signals having a white signal, the method comprising: converting the three color image signals into the four color image signals depending on the calculated increasing ratio and the three color image signals [0048].

28. Higgins doesn't teach: extracting a maximum value and a minimum value of the three color image signals; reading a white scaling signal from an external; selecting a corresponding white scaling factor of the white scaling factors based on the read white scaling signal; determining that the three image color signals are included in a fixed scaling area or a variable scaling area based on the maximum value and the minimum value; calculating a increasing ratio depending on a fixed scaling factor based on the selected white scaling factor when the three color image signals are included in the fixed scaling area; calculating the increasing ratio based on the maximum value, the minimum value, and the selected white scaling factor when the three color image signals are included in the variable scaling area.

29. The analogous prior art Dyke teaches: reading a white scaling signal from an external (fig. 3, 124); selecting a corresponding white scaling factor of the white scaling factors based on the read white scaling signal (fig. 5, 162) for the benefit of providing a color space conversion system and method that may linearly adjust the input to and the output from the conversion matrix independent of the color look up table efficiently.

30. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine reading a white scaling signal from an external; selecting a corresponding white scaling factor of the white scaling factors based on the read white scaling signal as shown in Dyke with Higgins for the benefit of providing a color space conversion system and method that may linearly adjust the input to and the output from the conversion matrix independent of the color look up table efficiently.

31. The previous combination of Higgins and Dyke remains as above but doesn't teach: extracting a maximum value and a minimum value of the three color image signals; determining that the three image color signals are included in a fixed scaling area or a variable scaling area based on the maximum value and the minimum value; calculating a increasing ratio depending on a fixed scaling factor based on the selected white scaling factor when the three color image signals are included in the fixed scaling area; calculating the increasing ratio based on the maximum value, the minimum value, and the selected white scaling factor when the three color image signals are included in the variable scaling area.

32. The analogous prior art Lee teaches: extracting a maximum value and a minimum value of the three color image signals (fig. 6, 50); determining that the three image color signals are included in a fixed scaling area or a variable scaling area based on the maximum value and the minimum value (fig. 4, 10); calculating a increasing ratio depending on a fixed scaling factor based on the selected white scaling factor when the three color image signals are included in the fixed scaling area (fig. 4, 12); calculating the increasing ratio based on the maximum value, the minimum value, and the selected white scaling factor when the three color image signals are included in the variable scaling area (fig. 4, 12) for the benefit of providing a method for

changing the brightness of an image, which can increase the brightness of the image while maintaining the hue and saturation of the image.

33. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine extracting a maximum value and a minimum value of the three color image signals; determining that the three image color signals are included in a fixed scaling area or a variable scaling area based on the maximum value and the minimum value; calculating a increasing ratio depending on a fixed scaling factor based on the selected white scaling factor when the three color image signals are included in the fixed scaling area; calculating the increasing ratio based on the maximum value, the minimum value, and the selected white scaling factor when the three color image signals are included in the variable scaling area as shown in Lee with the previous combination for the benefit of providing a method for changing the brightness of an image, which can increase the brightness of the image while maintaining the hue and saturation of the image.

34. Regarding claim 9, Higgins teaches: The method, further comprising: digamma processing the three color image signals (fig. 1, 108); and gamma processing the converted four color image signals (fig. 1, 110).

35. Regarding claim 10, the previous combination of Higgins and Dyke remains as above but doesn't teach: The method, wherein the conversion to four color image signals comprises: calculating first conversion image signals by multiplying the increasing ratio to the three color image signals; calculating a minimum value of the first conversion image signals; calculating a compensation value by dividing a value multiplied the selected white scaling factor to the minimum value into the scaling factor; and calculating resultant three color image signals by

subtracting the compensation from the first conversion image signals, and calculating the white signal by dividing the compensation into the selected white scaling factor.

36. The analogous prior art Lee teaches: The method, wherein the conversion to four color image signals comprises: calculating first conversion image signals by multiplying the increasing ratio to the three color image signals (fig. 10, 174); calculating a minimum value of the first conversion image signals (fig. 11, 190); calculating a compensation value by dividing a value multiplied the selected white scaling factor to the minimum value into the scaling factor (fig. 13, 232); and calculating resultant three color image signals by subtracting the compensation from the first conversion image signals (fig. 13, 230), and calculating the white signal by dividing the compensation into the selected white scaling factor (fig. 13, 232) for the benefit of providing a method for changing the brightness of an image, which can increase the brightness of the image while maintaining the hue and saturation of the image.

37. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine calculating first conversion image signals by multiplying the increasing ratio to the three color image signals; calculating a minimum value of the first conversion image signals; calculating a compensation value by dividing a value multiplied the selected white scaling factor to the minimum value into the scaling factor; and calculating resultant three color image signals by subtracting the compensation from the first conversion image signals, and calculating the white signal by dividing the compensation into the selected white scaling factor as shown in Lee with the previous combination for the benefit of providing a method for changing the brightness of an image, which can increase the brightness of the image while maintaining the hue and saturation of the image.

38. Regarding claim 12, Higgins teaches: The device, wherein the signal converting unit converts the three color image signals into the four color image signals depending on the calculated increasing ratio and the three color image signals [0048].

39. The previous combination of Higgins and Dyke remains as above but doesn't teach: extracts a maximum value and a minimum value of the three color image signals, determines that the three image color signals are included in a fixed scaling area or a variable scaling area based on the maximum value and the minimum value, calculates a increasing ratio based on a fixed scaling factor when the three color image signals are included in the fixed scaling area, calculates the increasing ratio based on the maximum value, the minimum value, and the selected white scaling factor when the three color image signals are included in the variable scaling area.

40. The analogous prior art Lee teaches: extracts a maximum value and a minimum value of the three color image signals (fig. 6, 50), determines that the three image color signals are included in a fixed scaling area or a variable scaling area based on the maximum value and the minimum value (fig. 4, 10), calculates a increasing ratio based on a fixed scaling factor when the three color image signals are included in the fixed scaling area (fig. 4, 12), calculates the increasing ratio based on the maximum value, the minimum value, and the selected white scaling factor when the three color image signals are included in the variable scaling area (fig. 4, 12) for the benefit of providing a method for changing the brightness of an image, which can increase the brightness of the image while maintaining the hue and saturation of the image.

41. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine extracts a maximum value and a minimum value of the three color image signals, determines that the three image color signals are included in a fixed scaling area or a

variable scaling area based on the maximum value and the minimum value, calculates a increasing ratio based on a fixed scaling factor when the three color image signals are included in the fixed scaling area, calculates the increasing ratio based on the maximum value, the minimum value, and the selected white scaling factor when the three color image signals are included in the variable scaling area as shown in Lee with the previous combination for the benefit of providing a method for changing the brightness of an image, which can increase the brightness of the image while maintaining the hue and saturation of the image.

42. Regarding claim 13, Higgins doesn't teach: The device, wherein the fixed scaling factor is to add "1" to the selected white scaling factor.

43. The analogous prior art Dyke teaches: The device, wherein the fixed scaling factor is to add "1" to the selected white scaling factor (fig. 4, 136) for the benefit of providing a color space conversion system and method that may linearly adjust the input to and the output from the conversion matrix independent of the color look up table efficiently.

44. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine wherein the fixed scaling factor is to add "1" to the selected white scaling factor as shown in Dyke with Higgins for the benefit of providing a color space conversion system and method that may linearly adjust the input to and the output from the conversion matrix independent of the color look up table efficiently.

Conclusion

45. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pub. Nos.: US 2004/0174389 A1; US 2004/0263528 A1; US 2005/0099426 A1; US 2005/0083341 A1; Patent No.: US 6,453,067 B1.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MAURICE MCDOWELL, JR whose telephone number is (571)270-3707. The examiner can normally be reached on Mon-Friday 7:30am - 5:00pm Eastern Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Xiao Wu can be reached on 571--272-7761. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MM

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